Comparison UUnifast and DRS

Souvik Sarkar and Mario Günzel

October 16, 2022

Abstract:
This is a short comparison of the evaluation results obtained from UUnifast and from DRS.

UUniFast:

For UUniFast suspension time ['sslength'] is drawn uniformly from the interval between the minimum suspension length value and maximum suspension length value. We have the following three setups:

- Setup 1 Short Suspension [0.0(Ti - Ci), 0.2(Ti - Ci)]
- Setup 2 Moderate Suspension [0.2(Ti - Ci), 0.4(Ti - Ci)]
- Setup 3 Long Suspension [0.4(Ti - Ci), 0.6(Ti - Ci)]

DRS:

Unlike UUniFast, Dirichlet- Rescaling Algorithm are used for asymmetric constraints and works with separate upper bounds and lower bounds for each task.

The three different setups for DRS used here:

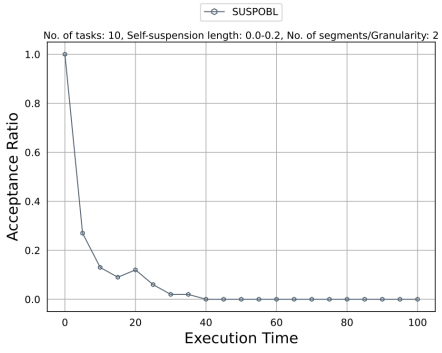
- Setup 1 (minsus+ex=0.1*number of tasks per set, maxsus+ex=1.0)
- Setup 2 (minsus+ex=0.3*number of tasks per set, maxsus+ex=1.0)
- Setup 3 (minsus+ex=0.5*number of tasks per set, maxsus+ex=1.0)

Here, we are taking three different setups each with different execution + suspension time but same execution time.

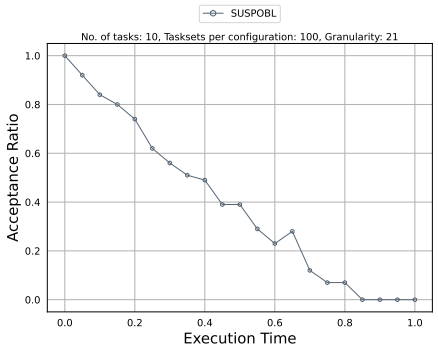
1 Suspension Oblivious

We are going to generate a suspension-oblivious schedule for the DRS and UUniFast setups explained above

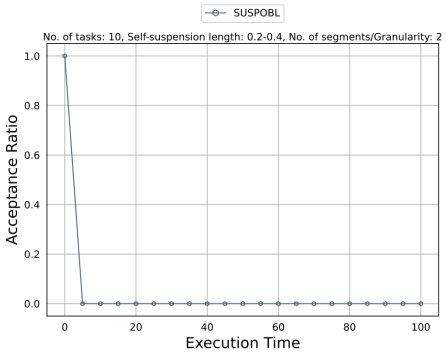
(UUnifast) **(DRS)**



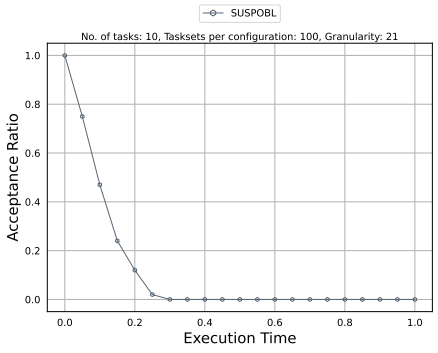
First UUnifast setup.



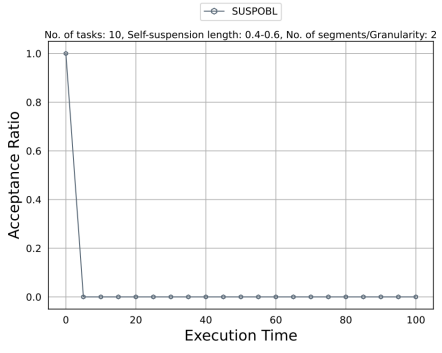
First DRS setup.



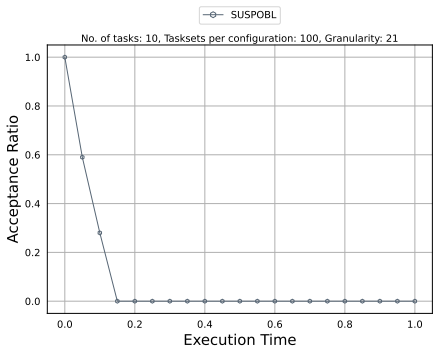
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

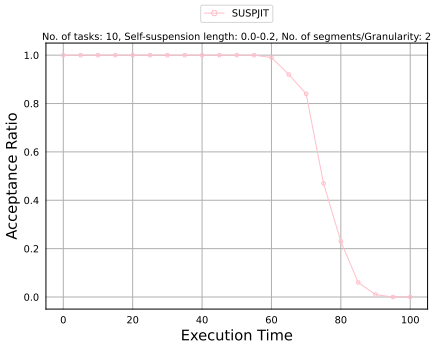


Third DRS setup.

2 Suspension Jitter

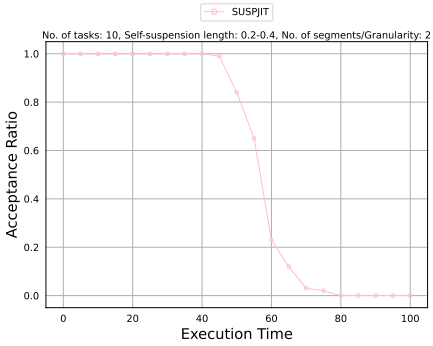
We are going to generate a suspension-jitter schedule for the DRS and UUniFast setups explained above

(UUnifast) **(DRS)**

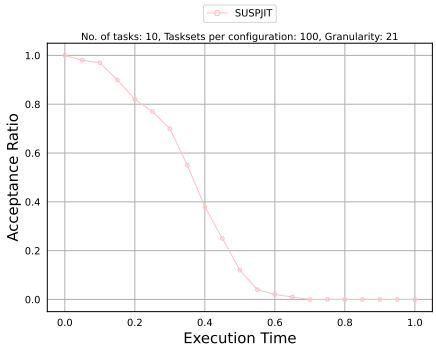


First UUnifast setup.

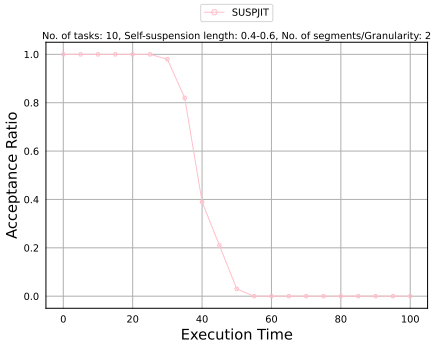
First DRS setup.



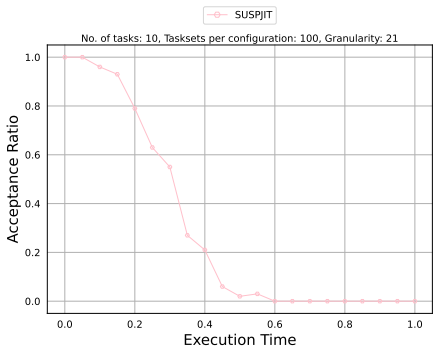
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

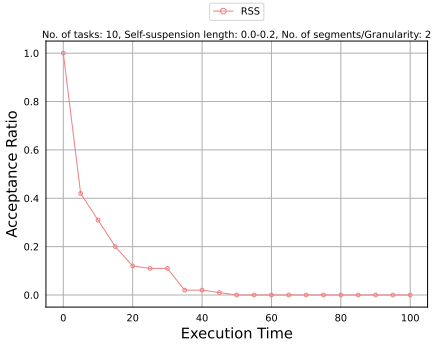


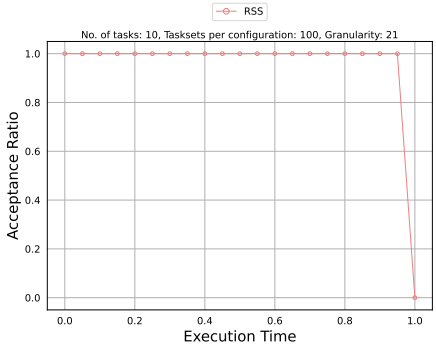
Third DRS setup.

3 RSS

We are going to generate a RSS schedule for the DRS and UUniFast setups explained above

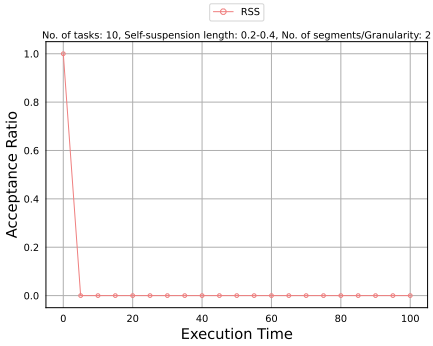
(UUnifast) **(DRS)**

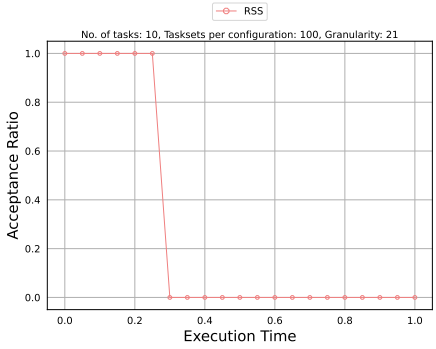




First UUnifast setup.

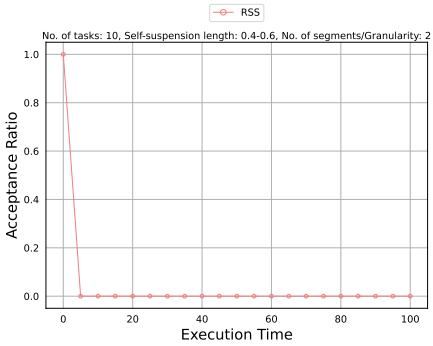
First DRS setup.

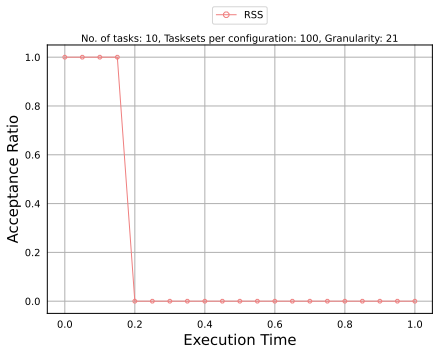




Second UUnifast setup.

Second DRS setup.





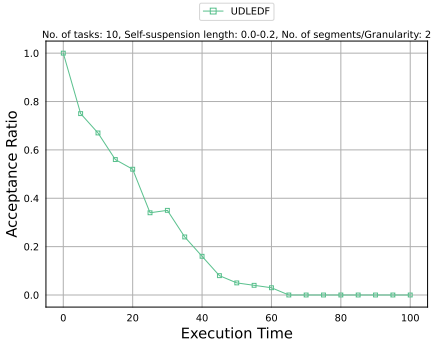
Third UUnifast setup.

Third DRS setup.

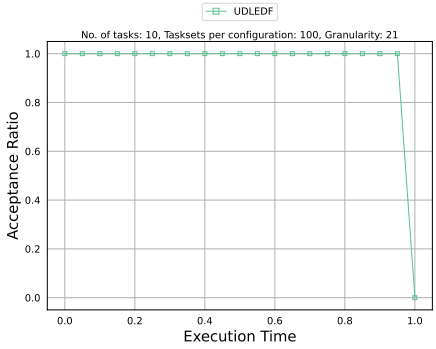
4 UDLEDF

We are going to generate a UDLEDF schedule for the DRS and UUniFast setups explained above

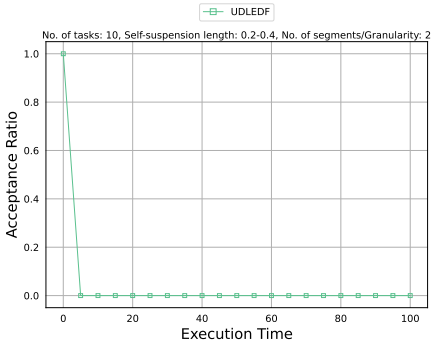
(UUnifast) **(DRS)**



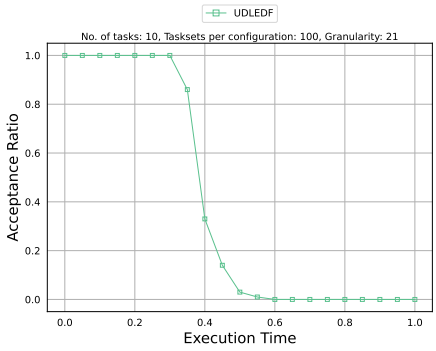
First UUnifast setup.



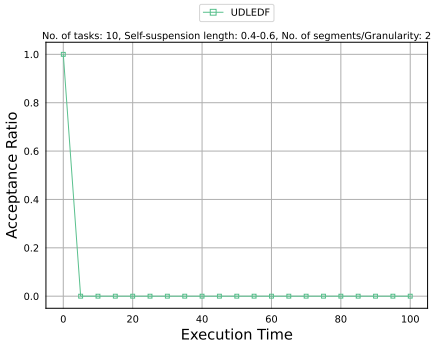
First DRS setup.



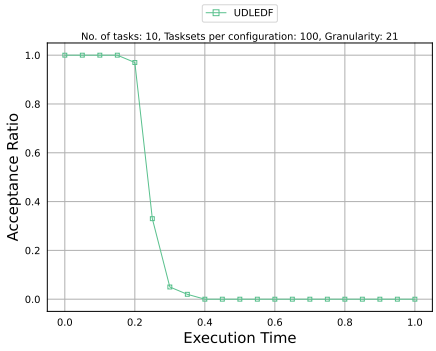
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

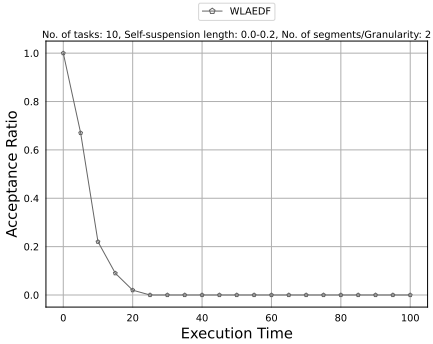


Third DRS setup.

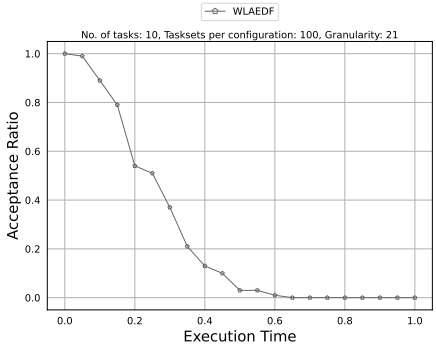
5 WLAEDF

We are going to generate a WLAEDF schedule for the DRS and UUniFast setups explained above

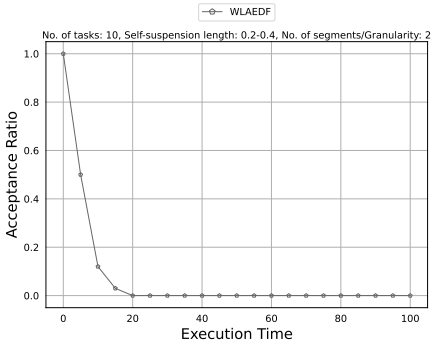
(UUnifast) **(DRS)**



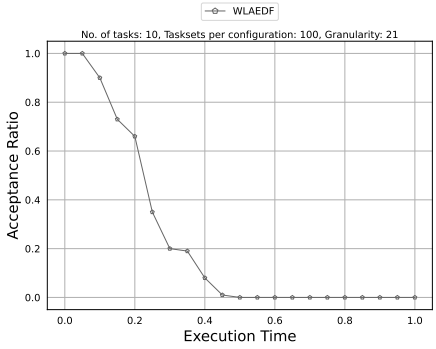
First UUnifast setup.



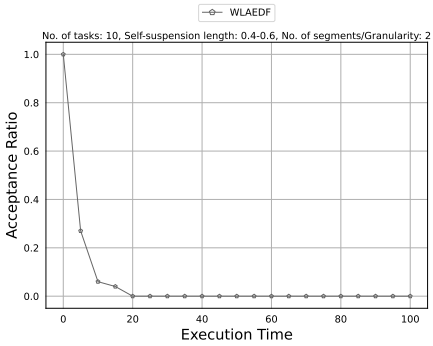
First DRS setup.



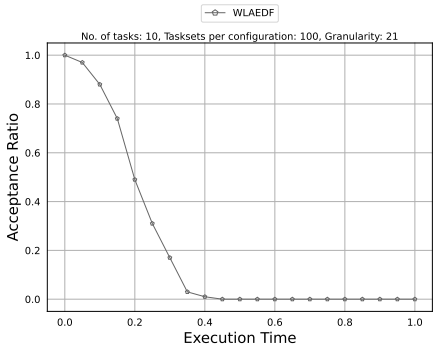
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

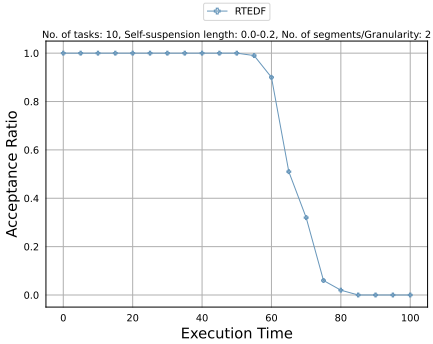


Third DRS setup.

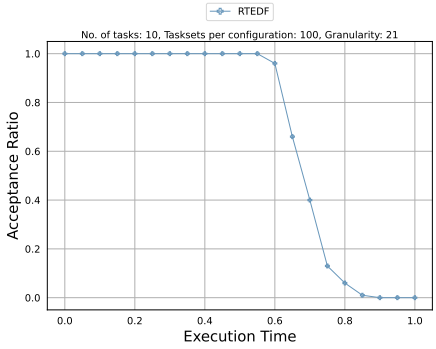
6 RTEDF

We are going to generate a RTEDF schedule for the DRS and UUniFast setups explained above

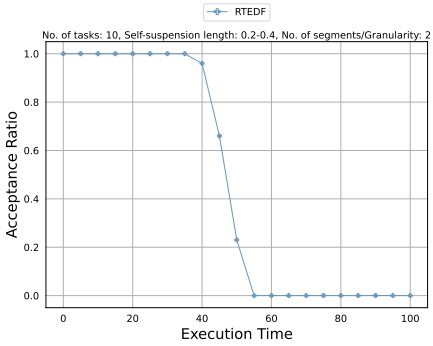
(UUnifast) **(DRS)**



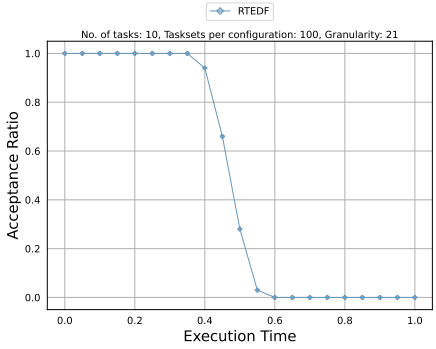
First UUnifast setup.



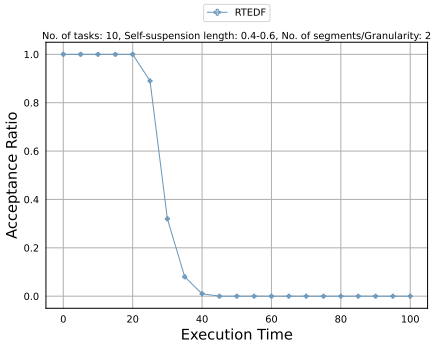
First DRS setup.



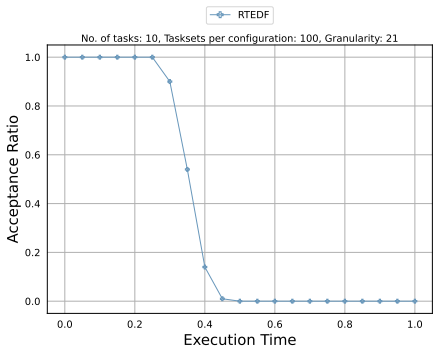
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

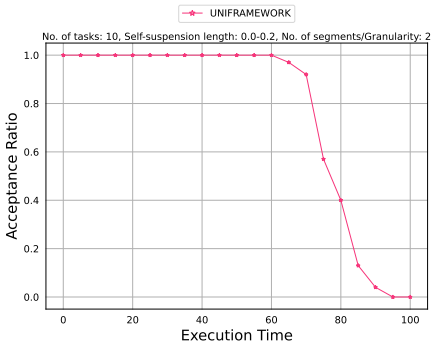


Third DRS setup.

7 UNIFRAMEWORK

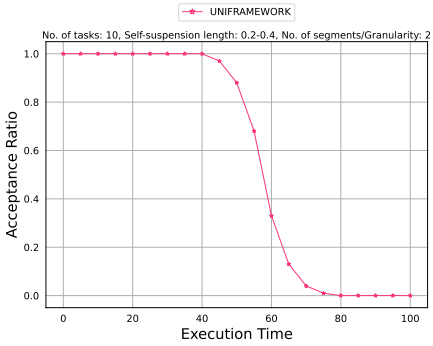
We are going to generate a Uniframework schedule for the DRS and UUniFast setups explained above

(UUnifast) **(DRS)**



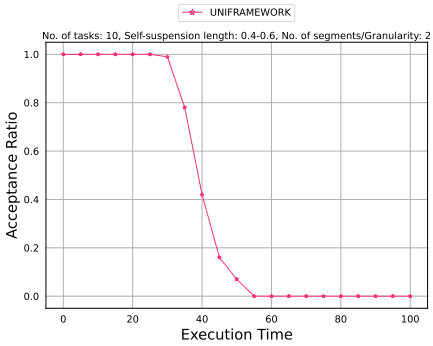
First UUnifast setup.

First DRS setup.

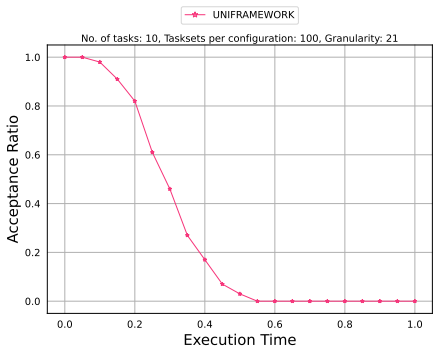


Second UUnifast setup.

Second DRS setup.



Third UUnifast setup.

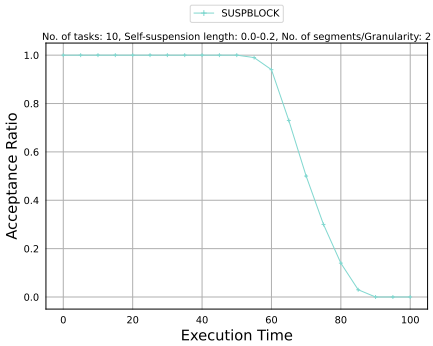


Third DRS setup.

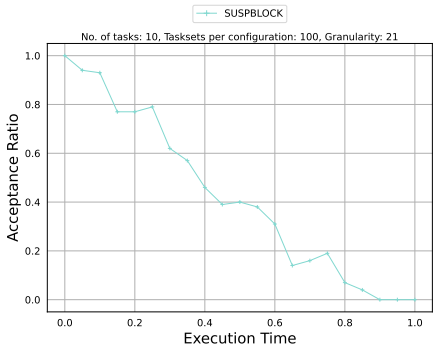
8 Suspension Block

We are going to generate a Suspension Block schedule for the DRS and UUni-Fast setups explained above

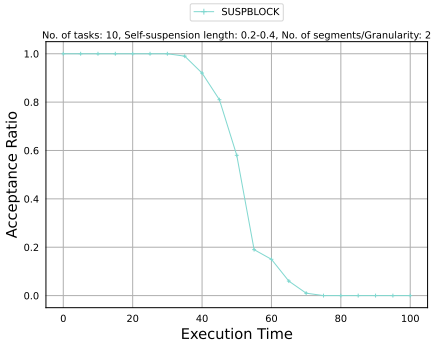
(UUnifast) **(DRS)**



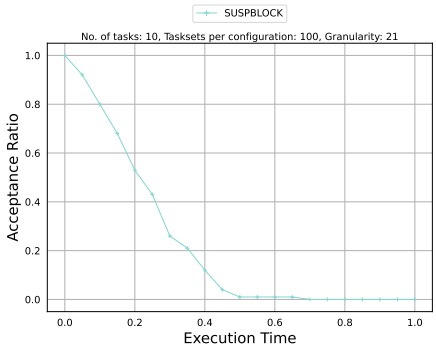
First UUnifast setup.



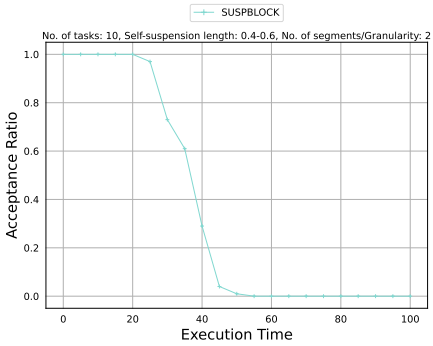
First DRS setup.



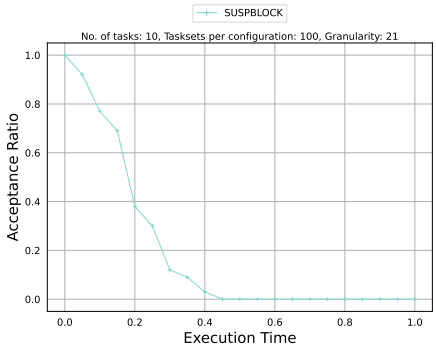
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

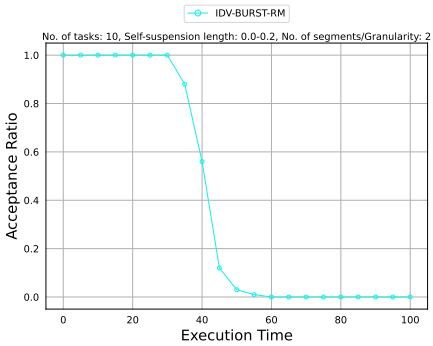


Third DRS setup.

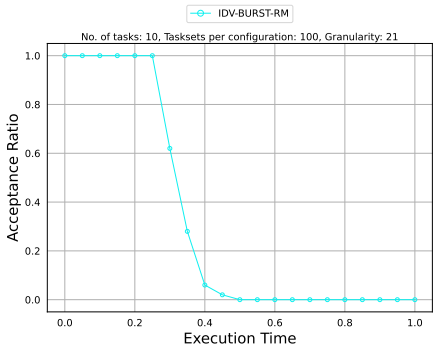
9 Idv Burst RM

We are going to generate a Idv Burst RM schedule for the DRS and UUniFast setups explained above

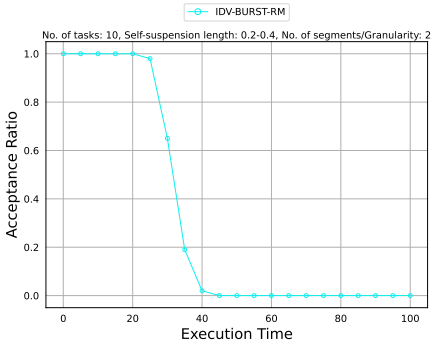
(UUnifast) **(DRS)**



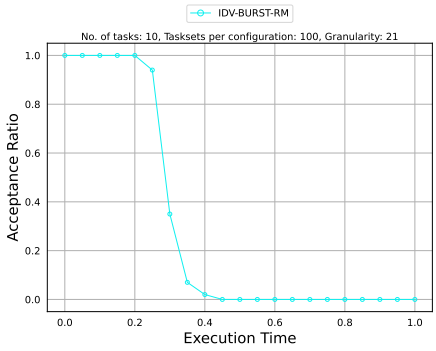
First UUnifast setup.



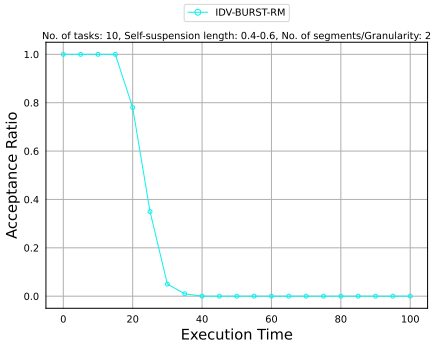
First DRS setup.



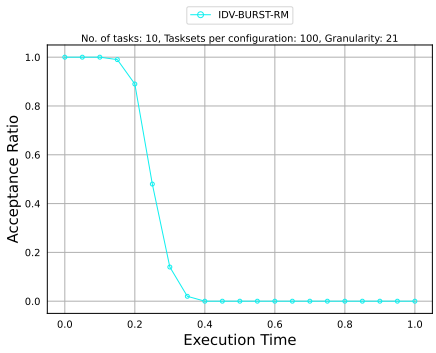
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.

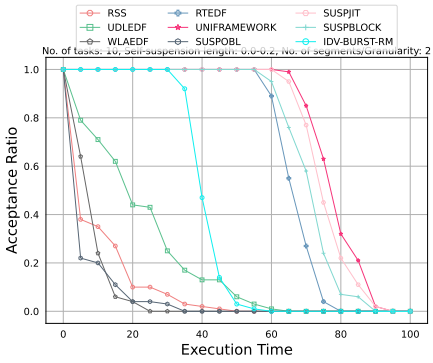


Third DRS setup.

10 Comparing all tests at a glance

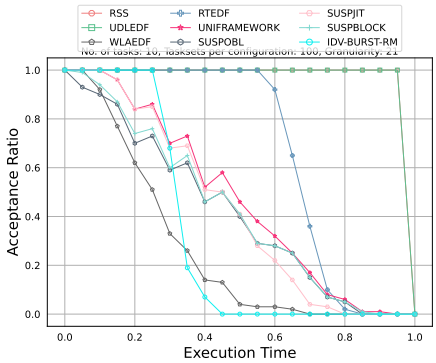
We are comparing the all the different schedulability tests for both DRS and UUnifast for each of the setups

(UUnifast)

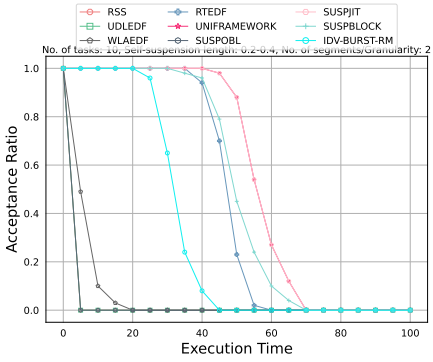


First UUnifast setup.

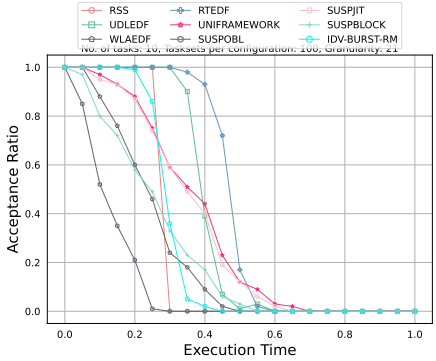
(DRS)



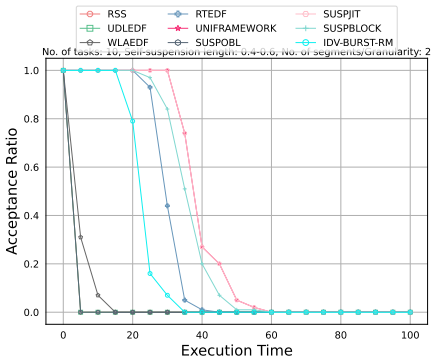
First DRS setup.



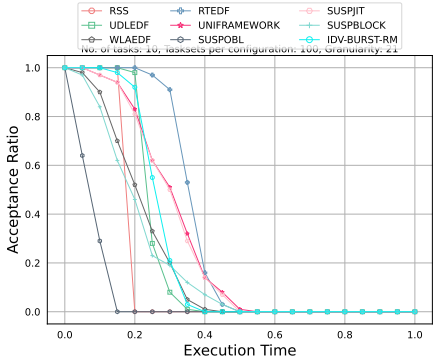
Second UUnifast setup.



Second DRS setup.



Third UUnifast setup.



Third DRS setup.

11 Evaluation:

So, the parameter we use to compare is **Acceptance Ratio** with respect to the execution time i.e the percentage of tasksets that got accepted for a particular execution time. We are generating 100 task sets per configuration with 10 tasks per set with a suspension values ranging between 0,0 - 0,6.